

# OPERATING INSTRUCTIONS

## DTC503/503-N/203/303



### SPECIFICATIONS

#### SENSOR

Sensor type	Temperature range (°C)	Resolution (°C)
J (Fe/K)	-99 to 750	1
K (Cr/Al)	-99 to 999	1
RTD (PT100)	-99 to 850	1

**DISPLAY:** Type: 7 segment LED; Height: 0.5" Digits: 3

#### CONTROL ACTION

S.No.	Control	Setting	Resolution 1°
1	Proportional	Band	1 to 99
2	ON/OFF	Hysteresis	1 to 99

#### ACCURACY

#### SET POINT LIMIT

#### RELAY ACTION

#### MANUAL RESET

#### SENSOR BREAK

#### TC REVERSE

#### OUTPUT

#### POWER

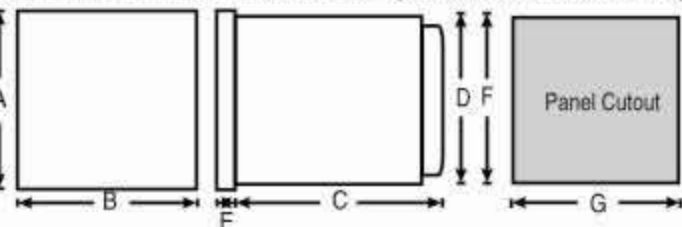
#### OPERATING TEMP.

#### HOUSING

#### HUMIDITY

#### WEIGHT (gms)

#### OVERALL DIMENSIONS (All dimensions in mm)



DIM	A	B	C	D	E	F	G
MODELS							
DTC503 / 503-N	48	48	100	45	7	46	46
DTC203	72	72	15	68	10	69	69
DTC303 / DTC303NX	96	96	70	90	10	92	92

### SAFETY SUMMARY

This manual is meant for the personnel involved in wiring, installation, operation, and routine maintenance of the equipment. All safety related codifications; symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If the equipment is not handled in a manner specified by the manufacturer it might impair the protection provided by the equipment.

**CAUTION:** Read complete instructions prior to installation and operation of the unit.

**CAUTION:** Risk of electric shock.

### INSTALLATION INSTRUCTIONS

**CAUTION:**

- 1.This equipment, being built-in-type, normally becomes a part of main control panel and in such case the terminals do not remain accessible to the end user after installation and internal wiring.
- 2.Conductors must not come in contact with the internal circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
- 3.Circuit breaker or mains switch must be installed between power source and supply terminals to facilitate power 'ON' or 'OFF' function. However this switch or breaker must be installed in a convenient position normally accessible to an operator.

**CAUTION:**

- 1.The equipment shall not be installed in environmental conditions other than those specified in this manual.
- 2.Fuse Protection-The equipment does not contain built-in fuse. Installation of external fuse for electrical circuitry is highly recommended. Recommended rating of such fuse shall be 275VAC/1A.
- 3.Since this is a built-in-type equipment (finds place in main control panel), its output terminals get connected to host equipment. Such equipment shall also comply with basic EMI/EMC and safety requirements like BS EN 61326-1 and BS EN 61010 respectively.
- 4.Thermal dissipation of equipment is met through ventilation holes provided on chassis of equipment. Such ventilation holes shall not be obstructed else it can lead to a safety hazard.
- 5.The output terminals shall be strictly loaded to the manufacturer specified values/range.

### INSTALLATION GUIDELINES

#### Mechanical Installation:

For installing the controller

1. Prepare the panel cutout with proper dimensions as shown in **OVERALL DIMENSIONS**
2. Remove the clamp from the controller.
3. Push the controller into the panel cutout. Secure the controller in its place by pushing the clamp on the rear side. The screws, of the pane of the clamp, must be in the foremost forward slot.
4. For proper sealing, tighten the screws evenly with required torque.

**CAUTION:**

The equipment in its installed state must not come in close proximity to any heating sources, caustic vapors, oils, steam, or other unwanted process by-products.

#### EMC Guidelines:

1. Use proper input power cables with shortest connections and twisted type.
2. Layout of connecting cables shall be away from any internal EMI source.

### WIRING INSTRUCTIONS

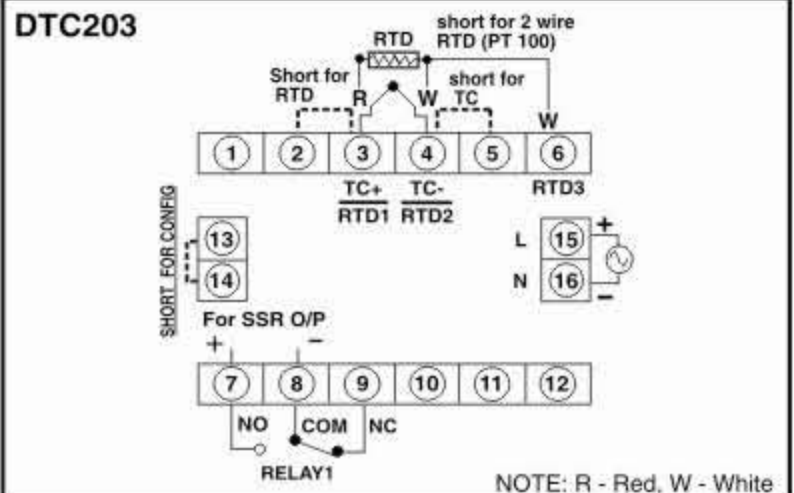
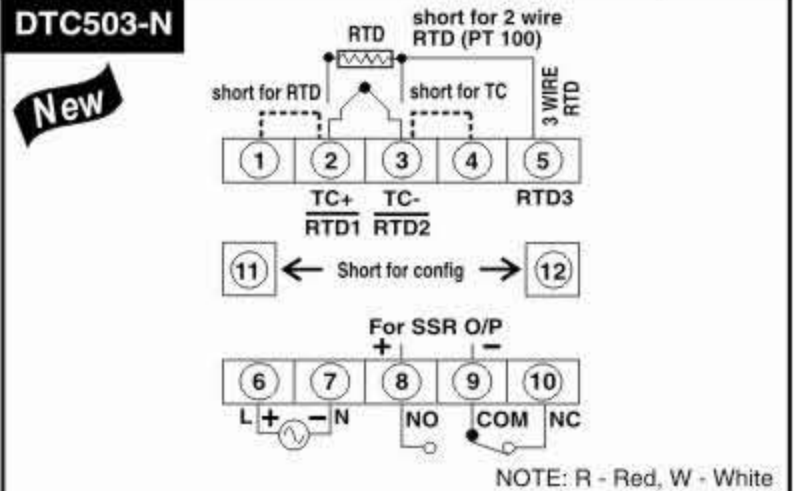
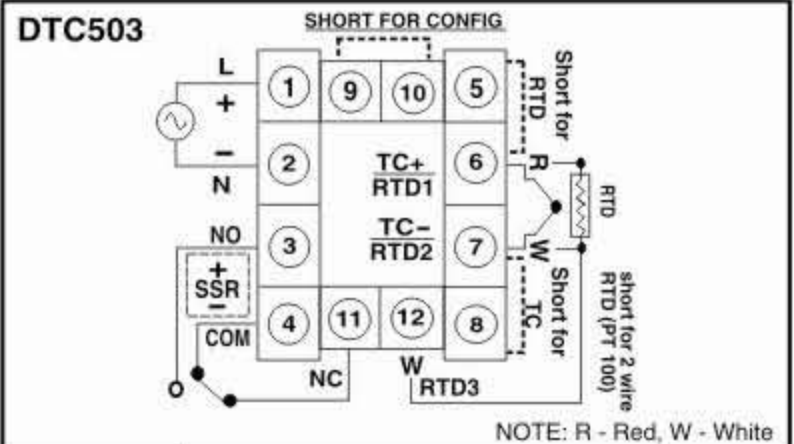
**CAUTION:**

1. To prevent the risk of electric shock power supply to the equipment must be kept OFF while doing the wiring arrangement.
- 2.Terminals and electrically charged parts Shouldnot be touched when the power is ON.
3. Wiring shall be done strictly according to the terminal layout with shortest connections. Confirm that all connections are correct.
4. Use lugged terminals to meet M3 screws.
5. To eliminate electromagnetic interference use of short wire with adequate ratings and twists of the same in equal size shall be made.
6. Cable used for connection to power source, must have a cross section of 1 or greater. These wires shall have insulation capacity made of at least 1.5KV.

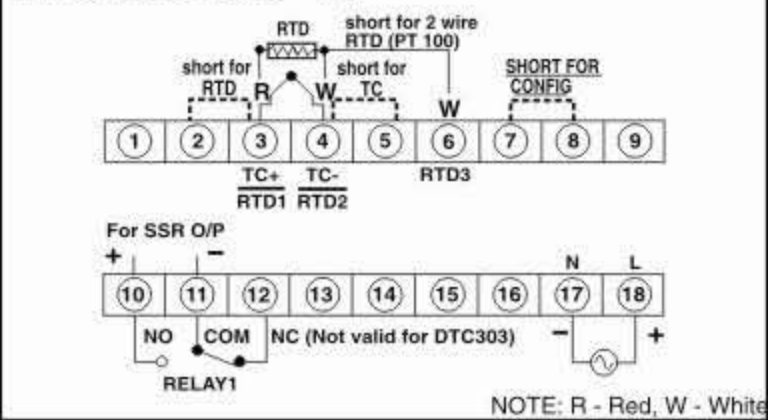
### MAINTENANCE

- 1.The equipment should be cleaned regularly to avoid blockage of ventilating parts.
- 2.Clean the equipment with a clean soft cloth . Do not use Isopropyl alcohol or any other cleaning agent.

### TERMINAL CONNECTIONS



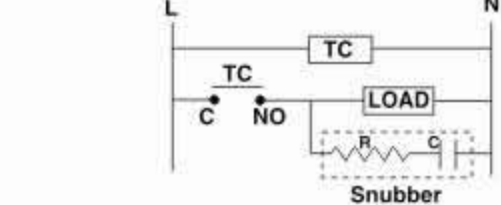
### DTC303 / DTC303 - NX



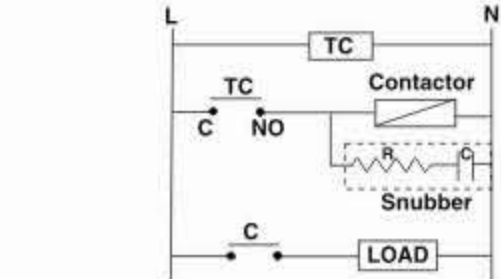
MODELS	DTC503	DTC503-N	DTC203	DTC303	DTC303 NX
TERMINAL DESCRIPTION					
L	1	6	15	18	18
N	2	7	16	17	17
NO / SSR O/P +	3	8	7	10	10
NC	1	10	9	-	12
COM / SSR OP -	4	9	8	1	11
TC+ / RTD1	6	2	3	3	3
TC- / RTD2	7	3	4	4	4
RTD3	12	5	6	6	6
SHORT FOR CONFIG	9 - 10	11-12	13-14	7-8	7-8
SHORT FOR TC	7 - 8	3 - 4	4 - 5	4 - 5	4 - 5
SHORT FOR RTD	5 - 6	1 - 2	2 - 3	2 - 3	2 - 3

### TYPICAL CONNECTIONS FOR LOADS :

1) For load current less than 0.5A



2) For bigger loads use interposing relay/contractor



**NOTE:** Use snubber as shown above to increase life of internal relay of temperature controller.

### ELECTRICAL PRECAUTIONS DURING USE

Electrical noise generated by switching of inductive loads and can create momentary disruption, erratic display, latch up, data loss or permanent damage to the instrument. Hence to reduce to noise:

- a) Use MOV across supply of temperature controller & snubber circuits across loads are recommended
- b) Use separate shielded wires for inputs.



**CONFIGURATION SCHEME** (parameter setting)

1) Before configuration: Short terminals marked **SHORT FOR CONFIG**

2) Turn power ON

3) Program configuration setting as per instructions below.

Key press	Display	Description
<b>1. To select sensor type.</b> Factory setting: J		
(Display <b>1nP</b> for 1 second)		
SENSOR TYPE	<b>J</b>	J (-99 to 750°C)
Press <b>□+▲</b>	<b>K</b>	K (-99 to 999°C)
Press <b>□+▲</b>	<b>PT100</b>	PT100 (-99 to 850°C)
<b>2. Press ▲ to select control mode</b> Factory setting: On/Off		
(Display <b>CnE</b> for 1 second)		
CONTROL MODE	<b>ON</b>	ON / OFF mode
Press <b>□+▲</b>	<b>Pr</b>	Proportional mode
<b>3. Press ▲ to select proportional band or hysteresis value</b> Factory setting: 1°C for on/off, 10°C for Prop		
(Display <b>Hy</b> in ON/ OFF mode or <b>Pb</b> in proportional mode for 1 second)		
Press <b>□+▲/▼</b> to change value	<b>01</b>	hysteresis value or proportional band
<b>4. Press ▲ to select Cycle time</b> Factory setting: 20 sec		
(Display <b>Cyc</b> for 1 second)		
Valid for proportional mode only		
Press <b>□+▲/▼</b> to change value	<b>20</b>	
<b>5. Press ▲ to select Relay output mode</b> Factory setting: forward		
(Display <b>FLY</b> for 1 second)		
RELAY OUTPUT	<b>HE</b>	Forward (heating)
Press <b>□+▲</b>	<b>CL</b>	Reverse (cooling)
Key press	Display	Description
<b>6. Press ▲ to select Maximum set point limit</b> Factory setting: For J sensor: 400°C, For K sensor: 400°C, For PT100 sensor: 400°C		
(Display <b>H1</b> for 1 second)		
Press <b>□+▲/▼</b> to change value	<b>400</b>	Maximum Set point Limit

**7. Press ▲ to select Manual reset (offset adjustment) lock** Factory setting: Enable

New feature - Ver 1.1 onwards

(Display **LCF** for 1 second)

MANUEL RESET (OFFSET ADJUSTMENT) LOCK

Press **□+▲/▼** to change value **EN** Enable Lock

Press **□+▲/▼** to change value **DS** Disable Lock

**8. Press ▲ to select reset all mode**

At reset all: all parameters set to Factory setting value

Note: Reset all function to be used prior to changing input (to realign related parameters)

(Display **rSE** for 1 second)

RESET ALL **0** No reset

Press **□+▲** **1** No reset

Press **□+▲** **2** No reset

Press **□+▲** **3** No reset

Press **□+▲** **4** No reset

Press **□+▲** **5** Reset all

By pressing **▲** key it goes to sensor input menu

**After configuration setting:**

1) Turn power OFF

2) Remove link between terminals marked **SHORT FOR CONFIG**.

3) Turn power on

**Programming Set Point**

A) To view set point : Press **□** key

B) To increase / decrease set point : Press **□+▲/▼**

Continuous operation of above makes update speed faster in 3 stages after 7 seconds.

**Programming Manual (offset adjustment) reset**

**NOTE:** This selection is valid only if parameter 7 is configured as Disable

**CAUTION:** Ensure terminals marked **SHORT FOR CONFIG** are open. To program Manual offset : Press **▲+▼** keys together for 3 seconds.

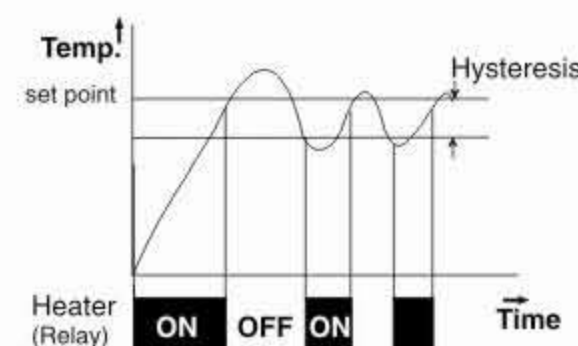
**Manual (offset adjustment) reset** Factory setting: 00

Key press	Display	Description
(Display <b>OFF</b> for 1 second)		
Press <b>□+▲/▼</b> to change value	<b>00</b>	Manual reset
To quit programming: Press <b>▲+▼</b> keys together for 3 seconds		

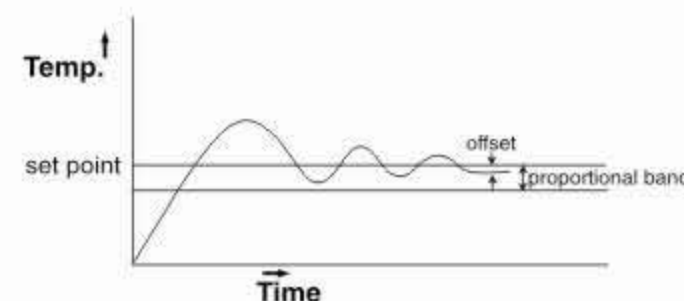
#### USER GUIDE :

**1) ON/OFF control action (for heating) :** The relay is 'ON' up to the set temperature and cuts 'OFF' above the set temperature. As the temperature of the system drops, the relay is switched 'ON' at a temperature slightly lower than the set point.

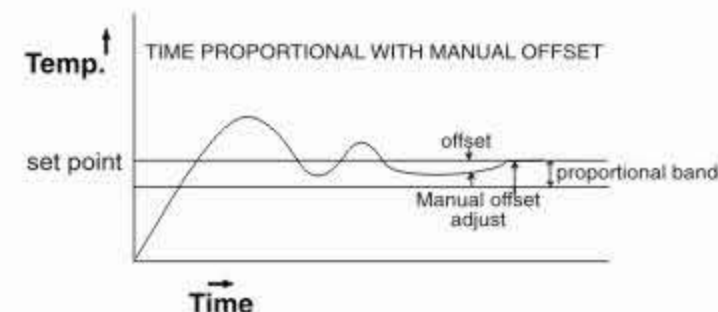
**Hysteresis:** The difference between the temperature at which relay switches 'ON' and at which relay switches 'OFF' is the hysteresis or dead band



**2) Time proportional control:** In Proportional control, the relay 'ON' time and relay 'OFF' time varies in proportion to the deviation of the actual temperature from the set value. The proportional action occurs within a band below the set point. The proportional mode of control gives closer control than ON/OFF type.



**3) Offset adjustment (manual reset):** After some time the process temperature settles at some point and there is a difference between the set temperature & the controlled temperature. This difference can be removed by setting the manual reset value equal & opposite to the offset.



#### CALIBRATION CERTIFICATE

Date:

Model No: \_\_\_\_\_

Sr. No.: \_\_\_\_\_

**Claimed Accuracy:**  $\pm 0.25\%$  of full scale  $\pm 1$  digit (After 20min warmup time)

#### Sources calibrated against:

Hinditron Multimeter, Model 86, Sr.No.:1094

#### Multimeter calibration report no:

ERTL (W), Mumbai, INDIA

The calibration of this unit has been verified at the following values:

SENSOR	CALIBRATION TEMPERATURE (°C)	DISPLAY VALUE (°C)
J	35	35
	300	300
	600	600
K	35	35
	500	500
	990	990
RTD (PT100)	0	0
	300	300
	557	557

The thermocouple / RTD curves are linearised in this microprocessor based product; and hence the values interpolated between the readings shown above are also equally accurate; at every point in the curve.

Unit is accepted as accuracy is within the specified limit of claimed accuracy and certificate is valid up to one year from the date of issue

**CHECKED BY:** \_\_\_\_\_

(Specifications subject to change as development is a continuous process).

**Selec Controls Pvt. Ltd., India,**

(Formerly Selectron Process Controls Pvt. Ltd.)

Tel:91-22-28476443/1882, Fax:91-22-28471733,

Toll free: 1800 227 353, Website: www.selecindia.com

E- mail: sales@selecindia.com.